

## MDNR Appendix F - Section Specific Comment 126:Table 4-3,

### Comment:

Radiocarcinogenic Slope Factors, page 7 - The slope factors for uranium- 238 (U-238) plus 2 daughters are incorrect. The following applies: Inhalation slope factor, 9.35E-9; ingestion slope factor 5.62E-11; external slope factor 1.14E-7. For radon- 222 (Rn-222), an external slope factor of 8.48E-6 for Rn-222 plus daughters applies. Please confirm other slope factors in the table are consistent with EPA's radionuclide tables for adult worker.

### Discussion:

The slope factors listed on the July 15, 2010 version of EPA's Soil PRG Calculator were used to calculate risks in the draft risk assessment. These slope factors have been updated to match those listed on the latest version of EPA's Soil PRG Calculator. The section introducing the slope factors used in the West Lake Assessments has been revised to reflect this.

The entire revised Section 4.2.3 now reads:

### “4.2.3 Toxicity Assessment

The radionuclides selected for evaluation have not changed from those listed as constituents of concern in the BRA. The chemicals of concern (COCs) have changed, based on the latest screening values (Table 4-2). This COC list is common to all alternatives.

#### 4.2.3.1 Radiocarcinogens

EPA methodology relies on slope factors to convert the intake of radionuclides to risk. Slope factors for radionuclides have changed since the BRA was published. Slope factors for radionuclides of concern as of February 21, 2011 are listed in Table 4-3.

**Table 4-3 Radiocarcinogenic Slope Factors**

Radionuclide	Submersion			
		Adult Soil	Planer Soil	External Exposure
	Inhalation	Ingestion	External Exposure	
	Slope Factor	Slope Factor	Slope Factor	Slope Factor
	(risk/pCi)	(risk/pCi)	(risk/yr per pCi/g)	(risk/yr per pCi/m³)
Uranium Series				
Uranium 238 + 2 dtrs	9.35x10 <sup>-09</sup>	5.62x10 <sup>-11</sup>	1.14x10 <sup>-07</sup>	1.22x10 <sup>-10</sup>
Uranium 234	1.14x10 <sup>-08</sup>	5.11x10 <sup>-11</sup>	2.52x10 <sup>-10</sup>	5.10x10 <sup>-13</sup>
Thorium 230	2.85x10 <sup>-08</sup>	7.73x10 <sup>-11</sup>	8.19x10 <sup>-10</sup>	1.31x10 <sup>-12</sup>
Radium 226 + 10 dtrs	1.44x10 <sup>-08</sup>	8.94x10 <sup>-10</sup>	8.49x10 <sup>-06</sup>	7.87x10 <sup>-09</sup>

Radon 222 + 6 dtrs	1.80x10 <sup>-11</sup>	none	8.48x10 <sup>-06</sup>	7.85x10 <sup>-09</sup>
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#### Actinium Series

Uranium 235 + 1 dtr	1.01x10 <sup>-08</sup>	5.01x10 <sup>-11</sup>	5.44x10 <sup>-07</sup>	6.34x10 <sup>-10</sup>
Protactinium 231 + 8 dtrs	2.55x10 <sup>-07</sup>	4.99x10 <sup>-10</sup>	2.03x10 <sup>-06</sup>	2.12x10 <sup>-09</sup>

#### Thorium Series

Thorium 232 + 10 dtrs	1.81x10 <sup>-07</sup>	8.19x10 <sup>-10</sup>	1.23x10 <sup>-05</sup>	1.14x10 <sup>-08</sup>
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Note: Slope factor values list on this table were obtained on February 21, 2011 from [http://epa-prgs.ornl.gov/cgi-bin/radionuclides/rprg\\_search](http://epa-prgs.ornl.gov/cgi-bin/radionuclides/rprg_search).

#### 4.2.3.2 Carcinogenic Chemicals

Updated oral slope factors and inhalation unit risks for chemicals of concern are listed Table 4-4.

**Table 4-4 Carcinogenic Chemical Slope Factors**

Chemical	CAS	Oral Slope Factor <sup>a</sup> (kg-day/mg)	Inhalation Unit Risk <sup>a</sup> (m <sup>3</sup> /μg)
Aroclor-1254	011097-69-1	2.0 x10 <sup>00</sup>	5.71x10 <sup>-04</sup>
Arsenic, Inorganic	007440-38-2	1.50x10 <sup>00</sup>	4.30x10 <sup>-03</sup>
Chromium (VI)	018540-29-9	5.00x10 <sup>-01</sup>	8.40x10 <sup>-02</sup>
Lead and Compounds	007439-92-1	ND <sup>b</sup>	ND <sup>b</sup>

<sup>a</sup> [http://www.epa.gov/reg3hwmd/risk/human/rb-concentration\\_table/Generic\\_Tables/](http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/), February 21, 2011.

<sup>b</sup> ND signifies that data were not defined. EPA uses modeled blood concentrations to evaluate potential health effects from lead exposures.

#### 4.2.3.3 Non-Carcinogenic Chemicals

Information about health effects from chronic exposures to chemicals has changed since publication of the BRA in 2000. The latest information is publicly available at [http://www.epa.gov/reg3hwmd/risk/human/rb-concentration\\_table/index.htm](http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm). On February 21, 2011, updated values for chemical toxicity were retrieved from this site. Those values are reproduced in Table 4-5.

**Table 4-5 Non-Carcinogenic Reference Quantities**

<b>Chemical</b>	<b>CAS</b>	<b>Chronic Oral Reference Dose <sup>a</sup> (mg/kg-day)</b>	<b>Chronic Inhalation Reference Concentration <sup>a</sup> (mg/m<sup>3</sup>)</b>
Aroclor-1254	011097-69-1	2.00x10 <sup>-05</sup>	-
Arsenic, Inorganic	007440-38-2	3.00x10 <sup>-04</sup>	1.50x10 <sup>-05</sup>
Chromium (VI)	018540-29-9	3.00x10 <sup>-03</sup>	1.00x10 <sup>-04</sup>
Lead and Compounds	007439-92-1	ND <sup>b</sup>	ND <sup>b</sup>

<sup>a</sup> [http://www.epa.gov/reg3hwmd/risk/human/rb-concentration\\_table/Generic\\_Tables/](http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/), February 21, 2011.

<sup>b</sup> ND signifies that data were not defined. EPA uses modeled blood concentrations to evaluate potential health effects from lead exposures. "

EPA FEEDBACK:

EPA accepts this response and the proposed text changes.